Michael Arts Biography

Dr. Michael Arts has extensive knowledge in the use of essential fatty acids and other lipid-based biochemical tracers to examine the health/vitality of organisms in both aquatic and terrestrial ecosystems. Dr. Arts spent 24 years as a federal scientist (Environment Canada) and where he examined how globally important processes affect the production and distribution of essential fatty acids in food webs in wetlands and lakes on the Canadian Prairies and later in the Laurentian Great Lakes. He joined Ryerson University (Jan. 2014) as full Professor in the Department of Chemistry and Biology and where he studies the critical roles that essential fatty acids (EFA) play in maintaining the health/vitality of aquatic organisms and how globally-important processes (e.g. climate change, invasive species, contaminants) affect the production and distribution of EFA in food webs and, specifically, how these processes may be influencing the human food chain. Dr. Arts uses lipids and other biochemical tracers as tools to elucidate how food webs function under different levels of natural and anthropogenic stress. His current interests include quantifying:

- The role of essential fatty acids in human health and nutrition and how this relates to the occurrence of these fatty acids in aquatic ecosystems (both freshwater and marine).
- The benefits and the risks around the use of genetically-engineered seed oil crops (e.g. camelina and canola).
- The effects of climate change (and specifically increases in water and air temperatures) on the production of essential omega-3 fatty acids in aquatic and terrestrial organisms (e.g. algae, grasses, zooplankton, insects, fish, and birds).
- The risks (mercury, PCBs) versus the benefits (nutritious omega-3 fatty acids) associated with eating sportfish in Ontario (in the Great Lakes and in northern lakes on the Canadian Shield).
- The effects of stressors (e.g. UV radiation, lipophilic contaminants) on the ability of algae and aquatic invertebrates to accumulate various lipids including beneficial/nutritious omega-3 fatty acids, and, ultimately, how this affects biological productivity.
- Seasonal patterns of energy reserves in aquatic invertebrates and algae and establishing the ecological and evolutionary roles that energy reserves play in determining community structure.
- The effects of changes in the nutritional status of algae on the downstream survival and recruitment of zooplankton and larval fish.
- Dissolved and particulate lipids in water and the relationship of these energy sources to microbial/primary production.
- Population biology including the community and ecosystem consequences of herbivory, parasitism, and predator-prey interactions.